Amendments To The Claims

The following listing of claims shall replace all prior listings, and versions, of claims in this application.

Listing of Claims:

1. (Currently Amended) A polarization control method, comprising:

receiving an input optical signal at a first waveplate, the input optical signal having a state of polarization associated therewith;

selecting a first rotation direction for the first waveplate;

rotating the first waveplate a first step amount along the first rotation direction to adjust the state of polarization of the input optical signal;

monitoring a feedback signal to assess the efficacy of rotating the first waveplate; and

continuing rotation of the first waveplate for a non-fixed time period while the feedback signal satisfies a first condition.

2. (Currently Amended) The method of claim 1, wherein the first condition is associated with feedback minimization.

3. (Original) The method of claim 1, wherein the first condition is associated with feedback maximization.

4. (Original) The method of claim 1, wherein continuing the rotation of the first waveplate includes incrementing by the first step amount for each rotation.

5. (Original) The method of claim 1, wherein the first step amount is at least one degree.

6. (Original) The method of claim 1, wherein the first step amount is less than ten degrees.

7. (Original) The method of claim 1, wherein the first step amount is between about two and

three degrees.

8. (Original) The method of claim 1, further comprising:

further rotating the first waveplate along the first rotation direction if the feedback signal satisfies a second condition;

selecting a reverse rotation direction if the feedback signal does not satisfy the second condition; and

rotating the first waveplate a second step amount along the reverse rotation direction if the feedback signal does not satisfy the second condition.

9. (Original) The method of claim 8, wherein the second condition is a minimization condition, further rotating the first waveplate occurs if the feedback signal satisfies the second condition, selecting the reverse rotation direction occurs if the feedback signal does not satisfy the second condition, and rotating the first waveplate occurs if the feedback signal does not satisfy the second condition.

10. (Original) The method of claim 8, wherein the second condition is a maximization condition, further rotating the first waveplate occurs if the feedback signal satisfies the second condition, selecting the reverse rotation direction occurs if the feedback signal does not satisfy the second condition, and rotating the first waveplate occurs if the feedback signal does not satisfy the second condition.

11. (Original) The method of claim 8, wherein the first waveplate is further rotated along the first direction of rotation by the first step amount.

12. (Original) The method of claim 8, wherein the first rotation direction is clockwise.

13. (Original) The method of claim 8, wherein the first rotation direction is counterclockwise.

14. (Original) The method of claim 8, wherein the second step amount has a value double the first step amount.

15. (Original) The method of claim 8, wherein the first and second conditions are monotonically decreasing conditions.

16. (Original) The method of claim 8, wherein the first and second conditions are monotonically increasing conditions.

17. (Original) The method of claim 1, further comprising:

ceasing the continued rotation of the first waveplate once the feedback signal does not satisfy the first condition;

selecting a second waveplate;

selecting an initial rotation direction for the second waveplate;

rotating the second waveplate along the initial rotation direction a second step amount to adjust the state of polarization;

monitoring the feedback signal to assess the efficacy of rotating the second waveplate; and

continuing rotation of the second waveplate while the feedback signal satisfies a second condition.

18. (Original) The method of claim 17, further comprising:

further rotating the second waveplate along the initial rotation direction if the feedback signal satisfies a third condition;

selecting a reverse rotation direction if the feedback signal does not satisfy the third condition; and

rotating the second waveplate a third step amount along the reverse rotation direction if the feedback signal does not satisfy the third condition.

19. (Original) The method of claim 17, wherein the second step amount is equal to the first step amount, and the third step amount has a value double the first step amount.

20. (Original) The method of claim 17, wherein the initial rotation direction of the second

waveplate is the same as the first rotation direction for the first waveplate.

21. (Original) The method of claim 17, wherein continuing the rotation of the second waveplate includes incrementing by the second step amount for each rotation.

22. (Currently Amended) A method of controlling a state of polarization, comprising:

providing a plurality of waveplates;

continually adjusting a first one of the plurality of waveplates along a first rotation direction for a non-fixed time period while a feedback signal satisfies a first condition;

ceasing adjusting the first waveplate if the feedback signal does not satisfy the first condition;

continually adjusting a second one of the plurality of waveplates along a second rotation direction for a non-fixed time period while the feedback signal satisfies a second condition;

ceasing adjusting the second waveplate if the feedback signal does not satisfy the second condition;

continually adjusting a third one of the plurality of waveplates along a third rotation direction for a non-fixed time period while the feedback signal satisfies a third condition; and

ceasing adjusting the third waveplate if the feedback signal does not satisfy the third condition.

23. (Original) The method of claim 22, wherein the first rotation direction, the second rotation direction and the third rotation direction are all clockwise.

24. (Original) The method of claim 22, wherein the first rotation direction, the second rotation direction and the third rotation direction are all counterclockwise.

25. (Original) The method of claim 22, wherein the waveplates are arranged in a serial fashion and are adjusted sequentially.

26. (Original) The method of claim 22, wherein each of the waveplates functions as a quarter wave plate.

27. (Original) The method of claim 26, wherein the quarter wave plates are not associated together as a half wave plate.

28. (Original) The method of claim 22, wherein the first, second and third conditions values are equivalent.

29. (Original) The method of claim 22, wherein the plurality of waveplates comprise a polarization controller.

30. (Original) The method of claim 22, wherein a first subset of the plurality of waveplates comprises a first polarization controller, and a second subset of the plurality of waveplates comprises a second polarization controller.

31. (Original) The method of claim 22, wherein the first, second and third conditions are selected such that the state of polarization is confined within a zone of acceptability.

32. (Original) The method of claim 31, wherein the zone of acceptability represents suppression of unwanted orthogonal polarization of about -20 dB.

33. (Original) The method of claim 31, wherein the zone of acceptability represents a suppression of unwanted orthogonal polarization of between -5 dB and -40 dB.

34. (Original) The method of claim 31, wherein the zone of acceptability is selected to minimize loss control effects.

35. (Original) The method of claim 22, further comprising receiving an input optical signal at the first waveplate from an input single-mode optical fiber.

36. (Original) The method of claim 35, further comprising transmitting an output optical signal from the final waveplate to an output single-mode optical fiber.

37. (Original) The method of claim 35, wherein the input optical signal comprises at least one pair of channels, the pair of channels being orthogonally polarized with respect to each other.

38. (Original) The method of claim 22, further comprising:

determining an initial rotation direction; and

rotating the first waveplate one step along the initial rotation direction prior to continually adjusting the first waveplate.

39. (Original) The method of claim 38, further comprising:

if the feedback signal satisfies the first condition after rotating the first waveplate the one step, setting the first rotation direction equal to the initial rotation direction; and

if the feedback signal does not satisfy the condition after rotating the first waveplate the one step, setting the first rotation direction equal to a reverse rotation direction.

40. (Currently Amended) A polarization control system, comprising:

a first optical transmission medium capable of receiving an input optical signal having an input state of polarization;

a plurality of waveplates operatively connected together, a first one of the waveplates being operable to receive the input optical signal from the first optical transmission medium;

a second optical transmission medium capable of receiving an output optical signal having an output state of polarization from a last one of the waveplates; and

polarization control logic operable to modify the input state of polarization so that the output state of polarization is obtained having a predetermined polarization criterion;

wherein the polarization control logic is operable to select a first direction of rotation for the first waveplate, to rotate the first waveplate a first step amount along the first direction of rotation to adjust the input state of polarization, to monitor a feedback signal to assess the efficacy of rotating the first waveplate, and to continue rotating the first waveplate for a non-fixed time period while the feedback signal satisfies a first condition.

41. (Original) The polarization control system of claim 40, wherein the plurality of waveplates is

between five and eight waveplates.

42. (Original) The polarization control system of claim 40, wherein the plurality of waveplates is between three and twelve waveplates.

43. (Original) The polarization control system of claim 40, wherein the waveplates are arranged in a serial fashion.

44. (Original) The polarization control system of claim 43, wherein the waveplates are adjusted sequentially by the polarization control logic.

45. (Original) The polarization control system of claim 40, wherein each of the waveplates functions as a quarter wave plate.

46. (Original) The polarization control system of claim 40, wherein the plurality of waveplates comprises a polarization controller.

47. (Original) The polarization control system of claim 40, wherein a first subset of the plurality of waveplates comprises a first polarization controller and a second subset of the plurality of waveplates comprises a second polarization controller.

48. (Currently Amended) The polarization control system of claim 40, wherein at least some of the waveplates are selected from the group consisting of a ~~a~~ $LiNbO_3$ component, a liquid crystal, a fiber loop and a fiber squeezer.

49. (Original) The polarization control system of claim 40, wherein the predetermined polarization criterion is a zone of acceptability.

50. (Currently Amended) A polarization control system, comprising:

a first optical transmission medium capable of receiving an input optical signal having an input state of polarization;

a plurality of waveplates operatively connected together, a first one of the plurality of waveplates being operable to receive the input optical signal from the first optical transmission medium;

a second optical transmission medium capable of receiving an output optical signal having an output state of polarization from a last one of the plurality of waveplates; and

polarization control logic operable to modify the input state of polarization such that the output state of polarization is obtained having a predetermined polarization criterion;

wherein the polarization control logic is operable to continually adjust the first waveplate along a first rotation direction for a non-fixed time period while a feedback signal satisfies a first condition, to cease adjusting the first waveplate if the feedback signal does not satisfy the first condition, to continually adjust a second one of the plurality of waveplates along a second rotation direction for a non-fixed time period while the feedback signal satisfies a second condition, to cease adjusting the second waveplate if the feedback signal does not satisfy the second condition, to continually adjust a final waveplate along a last rotation direction for a non-fixed time period while the feedback signal satisfies a third condition, and to cease adjusting the final waveplate if the feedback signal does not satisfy the third condition.

51. (Currently Amended) A polarization control apparatus, comprising:

a plurality of waveplates operatively connected together, a first one of the waveplates being operable to receive an input optical signal having an input state of polarization;

polarization control logic operable to modify the input state of polarization such that an output state of polarization is obtained at a last one of the waveplates, the output state of polarization having a predetermined polarization criterion; and

a feedback means operable to provide feedback information from the plurality of waveplates to the polarization control logic;

wherein the polarization control logic is operable to select a first direction of rotation for the first waveplate, to rotate the first waveplate a first step amount along the first direction of rotation to adjust the input state of polarization, to monitor the feedback information to assess the efficacy of rotating the first waveplate, and to continue rotating the first waveplate for a non-fixed time period while the feedback information satisfies a first condition.